IN THE CLAIMS

No claims are amended, canceled or added herein. The presently pending claims, along with their status identifiers, are provided below.

1. (Original) A hearing aid adapted to be worn in or about an ear, comprising:

a hearing aid housing;

a microphone to receive sound and to generate an input signal based on the sound;

a signal processing circuit housed by the housing and receiving the input signal from the microphone, the signal processing circuit to process the input signal and produce an output signal based on a plurality of signal processing parameters;

a receiver in the housing to transmit sound based on the output signal;

a parameter-select device accessible externally from the housing to select a parameter of the plurality of signal processing parameters to be adjusted; and

a parameter-adjust device accessible externally from the housing to adjust the parameter selected by the parameter-select device.

2. (Original) The hearing aid of claim 1, further comprising wherein the housing is adapted to be worn behind an ear.

3. (Original) The hearing aid of claim 1, further comprising wherein the housing is adapted to be positioned in a concha of an ear.

4. (Original) The hearing aid of claim 1, further comprising wherein the housing is adapted to be positioned in an auditory canal of an ear.

5. (Original) The hearing aid of claim 1, further comprising wherein the parameter-select device comprises a potentiometer located about an external surface of the housing.

6. (Original) The hearing aid of claim 1, further comprising wherein the parameter-adjust device comprises a potentiometer located about an external surface of the housing.

7. (Original) The hearing aid of claim 1, further comprising wherein:

the parameter-select device comprises a Resistance Technology Incorporated Trimmer Model 17 located about an external surface of the housing; and

the parameter-adjust device comprises a Microtronic Volume Control Model DCU 93 located on an external surface of the housing.

8. (Original) The hearing aid of claim 1, wherein the signal processing circuit comprises a digital signal processing circuit.

9. (Original) The hearing aid of claim 1, wherein the signal processing circuit comprises:

a program connection to receive instructions to be programmed into the signal processing circuit;

a processor;

a memory device coupled to the processor;

an interface coupled to the program connection, the processor, and the memory device to relay the instructions to the memory device and the processor;

a first analog-to-digital converter coupled between the microphone and the processor to convert the input signal from the microphone into a digital signal to be received by the processor; and

a digital-to-analog converter coupled between the processor and the receiver to convert a digital signal from the processor to the output signal to be received by the receiver.

10. (Original) The hearing aid of claim 9, wherein the signal processing circuit further comprises a second analog-to-digital converter coupled between the parameter-select device and the processor to convert an analog signal from the parameter-select device into a digital signal to be received by the processor to select one of the parameters.

11. (Original) The hearing aid of claim 10 wherein the signal processing circuit further comprises a pulse detect circuit coupled between the parameter-adjust device and the processor to detect pulses generated by the parameter-adjust device and to couple a signal to the processor to indicate the detected pulses.

12. (Original) The hearing aid of claim 11, wherein:

the memory device comprises an EEPROM;

the microphone comprises a high terminal coupled to a supply voltage, a middle terminal to couple the input signal to the first analog-to-digital converter, and a low terminal coupled to a ground voltage reference; and

the receiver comprises two terminals coupled to the digital-to-analog converter to receive the output signal.

13. (Original) The hearing aid of claim 12, wherein the parameter-select device comprises a parameter-select potentiometer comprising:

a high terminal coupled to the high terminal of the microphone, the supply voltage, and a first end of a resistor, a middle terminal that is in movable contact with the resistor and is coupled to the second analog-to-digital converter, and a low terminal coupled to a second end of the resistor and to the ground voltage reference, the parameter-select potentiometer to be rotated such that a voltage at the middle terminal of the parameter-select potentiometer will indicate its position;

a visible arrow pointing toward the selected parameter, each parameter being represented by a visible color-coded dot, the color-coded dots being fixed in relation to the parameter-select potentiometer, the color-coded dots to represent parameters comprising, respectively, a low cut filter frequency, a high cut filter frequency, a compression ratio, a threshold knee, a gain control, an output parameter, full-on parameters, and best fit parameters, the parameter-select potentiometer to be rotated to indicate one of the color-coded dots with the arrow; and

an indentation shaped to receive a screwdriver, the screwdriver to rotate the parameter-select potentiometer.

14. (Original) The hearing aid of claim 1, wherein the parameter-adjust device comprises a continuous digital potentiometer to produce positive pulses when rotated in a positive direction and to produce negative pulses when rotated in a negative direction, the continuous digital potentiometer being coupled to a pulse detect circuit in the signal processing circuit and one full rotation of the continuous digital potentiometer corresponds to an entire range of values for a parameter.

15. (Original) The hearing aid of claim 14, the continuous digital potentiometer further comprising an indentation shaped to receive a screwdriver, the screwdriver to rotate the continuous digital potentiometer.

16. (Original) The hearing aid of claim 9, further comprising:

a memory map stored in the memory device comprising a plurality of four-bit addresses, each four-bit address to address one of the parameters, the memory map further comprising a range of values between a high value and a low value for each parameter, the parameters comprising a low cut filter frequency, a high cut filter frequency, a compression ratio, a threshold knee, a gain control, and an output parameter.

17. (Original) The hearing aid of claim 16, further comprising wherein:

the parameter-select device comprises a parameter-select potentiometer and the second analog-to-digital converter coupled between the parameter-select potentiometer and the processor is coupled to convert an analog signal from the parameter-select potentiometer into a digital signal to be converted by the processor into a selected four-bit address in the memory map to address one of the parameters selected by the parameter-select potentiometer;

the pulse detect circuit is coupled to generate a signal to be used by the processor to modify a pointer, the pointer being stored in the memory device to point to a value in the memory map for the parameter associated with the selected four-bit address, the processor to modify the pointer to point to a next highest value each time a positive pulse is detected and to modify the pointer to point to a next lowest value each time a negative pulse is detected, the pointer being prevented from pointing to a value higher than the high value and the pointer being

prevented from pointing to a value lower than the low value, the processor to store the pointer when a new parameter is selected by the parameter-select potentiometer; and

the memory device is structured to store a separate pointer for each of the parameters and the processor is structured to process the input signal and the output signal according to values in the memory map pointed to by the stored pointers.

18. (Original) The hearing aid of claim 17, further comprising wherein when the parameter-select potentiometer is rotated to indicate full-on parameters, the processor is structured to modify the pointers stored in the memory device to point to full-on values in the memory map, the full-on values comprising the low cut filter frequency set for maximum gain, the high cut filter frequency set for maximum gain, the compression ratio set to 1:1, the threshold knee set to 45 dBSPL, and the output parameter set to maximum, the pointers to be modified according to full-on pointer data stored in the memory device.

19. (Original) The hearing aid of claim 17, further comprising wherein when the parameter-select potentiometer is rotated to indicate best fit parameters, the processor is structured to modify the pointers stored in the memory device to point to best fit values in the memory map, the best fit values having been selected according to audiometric data or data for a typical user, the pointers to be modified according to best fit pointer data stored in the memory device.

20. (Original) The hearing aid of claim 16, further comprising wherein the memory map is implemented in dedicated registers in the memory device.

21. (Original) A method of operating a hearing aid adapted to be worn in or about an ear, the method comprising:

receiving sound in a microphone in a hearing aid housing and generating an input signal based on the sound;

processing the input signal into an output signal in a signal processing circuit coupled to the microphone in the housing according to a plurality of parameters;

generating sound from the output signal in a receiver coupled to the signal processing circuit in the housing;

selecting one of the parameters with a parameter-select device on an external surface of the housing; and

adjusting the selected parameter with a parameter-adjust device on an external surface of the housing.

22. (Original) The method of claim 21 wherein selecting comprises rotating a parameter-select potentiometer on an external surface of the housing to one of a plurality of positions.

23. (Original) The method of claim 22 wherein selecting further comprises rotating the parameter-select potentiometer to point a visible arrow on the parameter-select potentiometer toward one of a plurality of color-coded dots, the color-coded dots to represent parameters comprising, respectively, a low cut filter frequency, a high cut filter frequency, a compression ratio, a threshold knee, a gain control, an output parameter, full-on parameters, and best fit parameters.

24. (Original) The method of claim 21, wherein adjusting the selected parameter comprises:

rotating a continuous digital potentiometer in a first direction to generate first pulses;

rotating the continuous digital potentiometer in a second direction to generate second pulses; and

detecting the pulses in a pulse detect circuit coupled to indicate the pulses to the signal processing circuit.

25. (Original) The method of claim 24, wherein the detecting the pulses in a pulse detect circuit further comprises modifying a pointer for the selected parameter based on a number of first pulses and a number of second pulses detected, the pointer for the selected parameter to point to a value of the selected parameter in a map of values.

26. (Original) The method of claim 24, wherein the detecting the pulses in the pulse detect circuit further comprises modifying a pointer for the new parameter based on a number of first pulses and a number of second pulses detected, the pointer to point to a value of the new parameter in the map of values.

27. (Original) The method of claim 21, wherein:

selecting one of the parameters further comprises selecting a four-bit address stored in a memory map in an EEPROM with the parameter-select device, the four-bit address associated with one of the parameters;

adjusting the selected parameter further comprises modifying a pointer stored in the EEPROM for the selected parameter with the parameter-adjust device, the pointer to point to a value in the memory map associated with the four-bit address for the selected parameter, each parameter being associated with a range of values between a high value and a low value; and

further comprising storing a pointer in the EEPROM for each parameter, each pointer to point to a value in the memory map for a respective parameter that is used by the signal processing circuit to process the input signal into the output signal.

28. (Original) The method of claim 27, wherein selecting one of the parameters further comprises:

moving a terminal of a parameter-select potentiometer along a resistor coupled between a supply voltage and a ground voltage reference to generate an analog signal at the terminal by rotating the parameter-select potentiometer to point a visible arrow at a visible color-coded dot representing the selected parameter, each of the parameters being represented by a color-coded dot fixed in relation to the parameter-select potentiometer;

converting the analog signal at the terminal into a digital signal in an analog-to-digital converter; and

converting the digital signal into the four-bit address associated with the selected parameter in a digital signal processing circuit.

29. (Original) The method of claim 28, wherein adjusting the selected parameter further comprises:

detecting first pulses and second pulses generated by first or second rotations of a continuous digital potentiometer in a pulse detect circuit coupled to indicate the first pulses and second pulses to the digital signal processing circuit;

reading the pointer for the selected parameter from the EEPROM;

modifying the pointer to point to a value in the memory map for the selected parameter associated with the four-bit address by modifying the pointer to point to a next highest value each time a first pulse is detected and modifying the pointer to point to a next lowest value each time a second pulse is detected;

preventing the pointer from pointing to a value higher than the high value;

preventing the pointer from pointing to a value lower than the low value; and

storing the pointer in the EEPROM when the parameter-select potentiometer is rotated to point the visible arrow at a new color-coded dot.

30. (Original) The method of claim 29, further comprising:

modifying the pointers to point to full-on values in the memory map for the parameters when the parameter-select potentiometer is rotated to point the arrow at a full-on parameters dot, the full-on values comprising a low cut filter frequency set for maximum gain, a high cut filter frequency set for maximum gain, a compression ratio set to 1:1, a threshold knee set to 45 dBSPL, and an output parameter set to maximum, the pointers to be modified according to full-on pointer data stored in the EEPROM; and

modifying the pointers to point to best fit values in the memory map for the parameters when the parameter-select potentiometer is rotated to point the arrow toward a best fit parameters dot, the best fit values having been selected according to audiometric data or data for a typical user, the pointers to be modified according to best fit pointer data stored in the EEPROM.

31. (Original) The method of claim 21, wherein processing further comprises:

converting the input signal into a digital input signal in an analog-to-digital converter;

processing the digital input signal into a digital output signal in a digital signal processing circuit according to the parameters; and

converting the digital output signal into the output signal in a digital-to-analog converter.

32. (Original) A hearing aid adapted to be worn in or about an ear, comprising:

a hearing aid housing;

a microphone to receive sound and to generate an input signal based on the sound;

a receiver in the housing to transmit sound from the hearing aid based on an output signal;

a first memory device in the housing to store first parameters;

a second memory device in the housing to store second parameters;

a memory select device on an external surface of the housing to select the first parameters in the first memory device or the second parameters in the second memory device; and

a signal processing circuit coupled between the microphone, the receiver, the first memory device, and the second memory device in the housing to process the input signal from the microphone and the output signal to be transmitted to the receiver according to the first parameters or the second parameters.

33. (Original) The hearing aid of claim 32, wherein the housing is adapted to be worn behind an auricle of the ear.

34. (Original) The hearing aid of claim 32, wherein the housing is adapted to be positioned in a concha of the ear.

35. (Original) The hearing aid of claim 32, wherein the housing is adapted to be positioned in an auditory canal of the ear.

36. (Original) The hearing aid of claim 32, wherein:

the first memory device comprises a first EEPROM; and

the second memory device comprises a second EEPROM.

37. (Original) The hearing aid of claim 32, wherein the memory select device comprises a pushbutton toggle switch located on an external surface of the housing to generate a pulse when pushed.

38. (Original) The hearing aid of claim 32, wherein the signal processing circuit comprises a digital signal processing circuit.

39. (Original) The hearing aid of claim 32, wherein the signal processing circuit comprises:

a program connection to receive instructions to be programmed into the signal processing circuit;

an interface coupled to the program connection, the first memory device, and the second memory device to relay the instructions to the first memory device and the second memory device;

a processor coupled to the interface, the first memory device, and the second memory device to receive the instructions;

an analog-to-digital converter coupled between the microphone and the processor to convert the input signal from the microphone into a digital signal to be received by the processor;

a pulse detect circuit coupled between the memory select device and the processor to detect a pulse generated by the memory select device and to couple a signal to the processor indicating the detected pulse; and

a digital-to-analog converter coupled between the processor and the receiver to convert a digital signal from the processor to the output signal to be received by the receiver.

40. (Original) The hearing aid of claim 32, wherein:

the microphone comprises a high terminal coupled to a supply voltage, a middle terminal to couple the input signal to the analog-to-digital converter, and a low terminal coupled to a ground voltage reference; and

the receiver comprises two terminals coupled to the digital-to-analog converter to receive the output signal.

41. (Original) The hearing aid of claim 32, wherein:

the first memory device comprises full-on parameters to cause the signal processing circuit to process the input signal from the microphone and the output signal to be transmitted to the receiver according to the full-on parameters when the first memory device is selected, the full-on parameters comprising a low cut filter frequency set for maximum gain, a high cut filter frequency set for maximum gain, a compression ratio set to 1:1, a threshold knee set to 45 dBSPL, and an output parameter set to maximum; and

the second memory device comprises best fit parameters to cause the signal processing circuit to process the input signal from the microphone and the output signal to be transmitted to the receiver according to the best fit parameters when the second memory device is selected, the best fit parameters having been selected according to audiometric data or data for a typical user.

42. (Original) A method of operating a hearing aid adapted to be worn in or about the ear, the method comprising:

receiving sound in a microphone in a hearing aid housing and generating an input signal based on the sound;

selecting one of a first memory device in the housing in which first parameters are stored and a second memory device in the housing in which second parameters are stored with a memory select device on an external surface of the housing;

processing the input signal into an output signal in a signal processing circuit coupled to the microphone, the first memory device, and the second memory device in the housing according to the first parameters or the second parameters selected by the memory select device; and

generating sound in a receiver coupled to the signal processing circuit in the housing from the output signal.

43. (Original) The method of claim 42, wherein selecting comprises pushing a pushbutton toggle switch located on an external surface of the housing to generate a pulse.

44. (Original) The method of claim 42, wherein selecting further comprises selecting one of a first EEPROM in the housing in which the first parameters are stored and a second EEPROM in the housing in which the second parameters are stored with the memory select device.

45. (Original) The method of claim 42, further comprising:

processing the input signal according to full-on parameters when the first memory device is selected by the memory select device, the full-on parameters comprising a low cut filter frequency set for maximum gain, a high cut filter frequency set for maximum gain, a compression ratio set to 1:1, a threshold knee set to 45 dBSPL, and an output parameter set to maximum.

46. (Original) The method of claim 45, further comprising processing the input signal according to best fit parameters when the second memory device is selected by the memory select device, the best fit parameters having been selected according to audiometric data or data for a typical user.

47. (Original) The method of claim 42, wherein processing further comprises:

converting the input signal into a digital input signal in an analog-to-digital converter;

processing the digital input signal into a digital output signal in a digital signal processing circuit according to the first parameters or the second parameters; and

converting the digital output signal into the output signal in a digital-to-analog converter.